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THESIS

MODERNIZATION OPTIONS FOR LIGHT UTILITY HELICOPTER FORCE STRUCTURE IN THE ARMY NATIONAL GUARD: FACTORS AND INFLUENCES AFFECTING FORCE STRUCTURE DETERMINATION

By

James R. Bittner

September 2001

Thesis Advisor: Harold Trinkunas
Second Reader: R. Mitchell Brown

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This thesis assesses the different options for modernizing Army National Guard light utility helicopter aviation assets for future roles and missions. It will review the political process by which Army National Guard aviation structure and modernization are determined.

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In brief, this thesis provides a careful examination of modernization and conversion options necessary to evaluate what constitutes maximum operational and cost effectiveness with regard to army aviation force structure.

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MODERNIZATION OPTIONS FOR LIGHT UTILITY HELICOPTER FORCE STRUCTURE IN THE ARMY NATIONAL GUARD: FACTORS AND INFLUENCES AFFECTING FORCE STRUCTURE DETERMINATION

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Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF ARTS IN INTERNATIONAL SECURITY AND CIVIL MILITARY RELATIONS

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ABSTRACT

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The United States military forces are continually deployed to various regions of the world to perform different missions, in a period characterized by increasingly austere defense budgets. A major budgetary challenge for defense planners is to balance operational costs, in terms of equipment modernization programs, with operational capabilities. The post-Cold War period, with its potential for redefining roles and missions, continues to evoke situations requiring a thorough and nonpartisan examination of military force structure for the United States Army and the Army National Guard. The objective of such an examination should be for optimizing force structure throughout the Army, in both active and guard units. Army National Guard aviation, with its dual federal and state role, requires a careful analysis to determine the optimal force structure and modernization strategy that will best suit the Guard for both roles.

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LIST OF SYMBOLS, ACRONYMS AND/OR ABBREVIATIONS

AAMP-	Army Aviation Moderization Plan
AAN-	Army After Next
AAWC-	Army Aviation Warfighting Center
ADCSOP-	Assistant Deputy Chief of Staff for Operations and Plans
AMP-	Army Modernization Plan
APA-	Army Aircraft Procurement Budget
ARI-	Aviation Restructure Initiative
ARNG-	Army National Guard
ATCOM-	Aviation and Troop Command
BUR-	Bottom-up Review
CINC-	Commander-in-Chief
CONUS-	Continental United States
COTS-	Commercial Off The Shelf
DCD-	Directorate of Combat Developments
DCSOPS-	Deputy Chief of Staff for Operation and Plans
DOD-	Department of Defense
DPG-	Defense Planning Guidance
DTLOMS-	Doctrine, Training, Leader Development, Organization, Material, and Soldier Requirements
EPAF-	Early Production and Fielding
FM-	Field Manual
FY-	Fiscal Year
GAO-	General Accounting Office
GOSC-	General Officer Steering Committee
GSAB-	General Support Aviation Battalion
HQDA-	Headquarters, Department of the Army
IPS-	Illustrative Planning Scenarios
JCS-	Joint Chiefs of Staff
LHTEC-	Allied Signal Manufacturer
LHX-	Light Helicopter Experimental
LUH-	Light Utility Helicopter
MFB-	Multi-function Battalion
MNS-	Mission Needs Statement
MOA-	Memorandum of Agreement
MRC-	Major Regional Conflicts
MTOE-	Modified Table of Organization and Equipment
NGB-	National Guard Bureau
NMS-	National Military Strategy
NSS-	National Security Strategy
O&M-	Operational and Maintenance
OPTEMPO-	Operational Tempo
ORD-	Operational Requirements Document
OSD-	Office of the Secretary of Defense

PM-	Program Manager
POM-	Program Objective Memorandum
SASC-	Senate Armed Services Committee
SAMAS-	Structure and Manpower Allocation System
SLEP-	Service Life Extension Program
SOF-	Safety of Flight
TAA-	Total Army Analysis
TAADS-R-	The Army Authorization Documents System-Redesign
TAP-	The Army Plan
TOE-	Table of Organization and Equipment
TRADOC-	Training and Doctrine Command
USAAVNC-	United States Army Aviation Center
USAR-	United States Army Reserve

EXECUTIVE SUMMARY

This thesis assesses the different options for modernizing Army National Guard light utility helicopter aviation assets for future roles and missions. It will review the political process by which Army National Guard aviation structure and modernization are determined.

The United States military forces are continually deployed to various regions of the world to perform different missions, in a period characterized by increasingly austere defense budgets. A major budgetary challenge for defense planners is to balance operational costs, in terms of equipment modernization programs, with operational capabilities. The post-Cold War period, with its potential for redefining roles and missions, continues to evoke situations requiring a thorough and nonpartisan examination of military force structure for the United States Army and the Army National Guard. The objective of such an examination should be for optimizing force structure throughout the Army, in both active and guard units. Army National Guard aviation, with its dual federal and state role, requires a careful analysis to determine the optimal force structure and modernization strategy that will best suit the Guard for both roles.

In brief, this thesis provides a careful examination of modernization and conversion options necessary to evaluate what constitutes maximum operational and cost effectiveness with regard to army aviation force structure.

The Senate Armed Services Committee (SASC) had little direct impact on LUH-related decisions. Senators and their professional staff did, however, let the Army know what sort of a modernization plan would be acceptable. For several years prior to the introduction of the Multi-function Battalion (MFB) force structure, Congress had been asking for a sound modernization plan from the Army. The senators' main criticism of Army plans was that they contained too many costly programs (e.g.,

Comanche) for the available budget. If the Army had presented a sound plan for the Light Utility Helicopter (LUH) structure and airframe design, with a detailed justification of its battlefield need, the SASC likely would have supported it.

Although Department of Defense (DOD) advisory committee members historically have close ties to industry and finance, research for this paper uncovered no link between advisory committees and the LUH force structure decision-making process.

I. INTRODUCTION

This thesis analyzes the influence of politics and decision-making on the U.S. Army's force structure developmental process. The study focuses on a single Army aviation force structure decision involving both the Army and the Army National Guard (ARNG). A case study will analyze the U.S. Army's Light Utility Helicopter (LUH) program for influences impacting the structure's development and subsequent fielding during the 1990s.

A. BACKGROUND

The fielding of the LUH structure provides a useful study of political influence and decision-making for several reasons. First, there are political actors in both the state and federal governments with interests related to the fielding of aviation force structure. These include congressmen, state politicians, and defense interest groups to name a few. Defense contractors competing for defense modernization funds have an interest in force structure programs as well. The LUH program both competed with and piggybacked on other procurement and modernization programs involving Army aviation. Secondly, the LUH program evolved in the post-Cold War period, where different components of the U.S. military establishment continued to vie for armed forces roles and missions. Reduced defense budgets and military downsizing have made decisions about modernizing existing combat platforms and the procurement of new ones, including Army utility helicopters, more complicated. Decision-makers have had a hard time planning the force structure of the Army National Guard, as they struggled to define the Guard's roles and missions as well as the military threat.

The post-Cold War environment provides a framework in which to examine factors affecting force structure decisions that may not have existed during the Cold War. This study identifies some specific factors

that should be considered in force structure decision-making, specifically at the Army National Guard level.

B. THE MACRO-LEVEL PROCESS

The Army has a process by which it determines force structure requirements. The thesis discusses that process in order to provide better insight into how force development and structure, such as an aviation battalion or similar unit, evolves with guidance derived from the National Military Strategy (NMS).

The Cold War threat, which drove our military decision-making processes since the end of World War II, no longer exists. This reduced threat environment has forced civilian and military leaders to scrutinize the U. S. armed forces' roles and missions, and to determine what force structure changes, if any, are needed to meet possible future threats.

The peacetime Army traditionally has received 22-24 percent of the Department of Defense (DOD) budget. Several recent events have caused fundamental changes in the size and budget of today's peacetime army. The Army has been downsized to a much smaller force, in personnel end-strength, equipment, and infrastructure, than it was during the Cold War. The emphasis is on transforming the Army from a threat-based Cold War force into a capabilities-based force for the future. Defense budget reductions and increased troop deployments make the transition a challenging task. Within the last decade, we saw a 300 percent increase in troop deployments and a corresponding 35 percent decrease in the Army's size. Our forces are now engaging in a wide array of challenging missions, and in more places than before. The difficult task has been to balance such competing requirements as current operational readiness and future readiness in an environment of constrained resources. Future readiness depends on modernization of priority weapons systems and other Army programs. The draw down of the Army during the last decade

corresponded with a budget reduction of more than 40 percent.[1] This has had an impact on numerous modernization goals and corresponding programs including utility helicopter procurement of the UH-60 and other force options for the LUH. Army aviation accepted risk in the near-term by deferring utility helicopter modernization in favor of modernizing attack helicopter assets through the procurement of the RAH-66 Comanche and funding for an Apache Longbow upgrade package. Since the Cold War ended in 1991, the Department of Defense has been under intense pressure from Congress and the White House to reduce expenditures. This has translated into delayed plans for modernizing the Army with the latest high-tech equipment. Meanwhile the Army, forced to utilize existing combat platforms and equipment, opted for short-term, lower cost upgrades in lieu of modernized ones. Army aviation currently is operating tactical helicopters beyond their originally expected service life.[2]

Increases in deployment OPTEMPO for the Army dictated the need for greater readiness, thus prioritizing funds for operations and training. The increased pace of these operations put a higher than anticipated strain on the useful life expectancy of Army equipment, resulting in a greater need for recapitalization. The increased OPTEMPO also created a greater demand for modernization of Army systems and equipment. In all, funding reductions have left a major gap between Army aviation's modernization, and new force structure plans for the twenty-first century.[3]

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[1] Edward G. Anderson, and Michael Linick, "Ensuring Future Victories Through Land Power Dominance: The U.S. Army Modernization Strategy," in *Military Strategy and Force Planning*, pp. 513-517.

[2] "But Can It Win a Budget War?" *Armed Forces Journal International*, April 94, pp. 36-39.

[3] Anderson and Linick, p. 515.

C. OVERVIEW OF THE DEVELOPMENT PROCESS.

The composition of the Army and the Army National Guard force structure is not completely within the purview of the Army. Force structure determination begins with the National Military Strategy that describes the strategic environment, sets objectives, and describes capabilities for carrying out strategy[4]. Overall force structure objectives are provided in the Defense Planning Guidance (DPG) published by the Department of Defense. In part, the DPG directs the number and type of divisions, or "operating forces," the Army should field to meet objectives outlined in the NMS. For example, the DPG specifies ten active army divisions as the number required to tackle two simultaneous major theater wars. The DPG also specifies other "operating forces" requirements, such as separate brigades or Special Forces groups, to accomplish this task.

In response to these documents, which are considered Joint Chiefs of Staff (JCS)/ (DOD) directives, the Army further specifies the numbers and types of units within the "operating forces." These forces are known as "generating forces," and include units below the divisional and corps levels. The breakout of these units, further delineated in the Army Plan (TAP), is produced by Headquarters Department of the Army.[5]

The process by which the Army further determines force structure is rather complex and involves a detailed analysis of input and guidance from several levels of the Army and the Department of Defense. Force structure models must be both affordable and balanced to support joint and Army planning, programming, and budgeting at all levels of military

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[4] U.S. Army War College, "How the Army Runs: A Senior Leader Reference Handbook," Ch. 5, Fig. 5-11, 1999-2000.

[5] TAP focuses on the six program years plus an additional ten. It presents complete strategic, mid-term planning, and programming guidance for the Army's programs and budget. TAP provides a summary of the current force structure, the POM force, and the projected force ten years beyond. Finally, it provides a start point for all other Army strategic functional plans and direction for the building of the POM ("How the Army Runs..." Ch. 4, para 4-14 thru 4-16).

operations: strategic, operational, and tactical. Total Army Analysis (TAA) is the mechanism by which the Army conducts force structure analysis and determination. The TAA is a multi-phased process consisting of qualitative and quantitative analyses designed to generate both the tactical and support forces necessary to carry out missions delineated in the DPG, TAP, and Illustrative Planning Scenarios. A complete explanation of the TAA process, which illustrates how the force structure developmental process takes place, is beyond the scope of the study.

TAA is a resource-sensitive process based on Army doctrine, strategic guidance from higher levels, threat analysis, defined scenarios, and established budgetary constraints. The Army's total warfighting requirements are a final product of the TAA process, conducted during even-numbered years. This biennial event also is the basis for the Army's contribution to the Program Objective Memorandum (POM) and established initial POM force.[6] The initial POM force is the force recommended and supported by resource requests in the Army's slice of the overall DOD POM. This POM force ultimately becomes part of the TAA base force for any given program year. Through the TAA process, requirements for supporting combat, combat support, and combat service support, at echelons above corps and divisions are defined.

As the Army moves forward with modernization programs, new doctrines, and changes to organizational structures, a tracking system identifies changes and manages them efficiently. The Structure and Manpower Allocation System (SAMAS), a computer database, maintains and tracks force structure information for the 8500+ units in the active Army, United States Army Reserve (USAR), and the ARNG. From the SAMAS system, the Army utilizes The Army Authorization Documents

[6] The POM is submitted to the Secretary of Defense recommending the total resources of funding requirements for current programs as well as new requirements for the future.

System-Redesign (TAADS-R) to record changes in unit missions, structure, and equipment. TAADS-R also defines requirements and authorizations for all TOE units using the SAMAS data. A Table of Organization and Equipment (TOE) is an organizational model developed from various sources of inputs through SAMAS. These include branch and functional proponent assessments of capabilities required on the battlefield. Identifying, documenting, and processing requirements culminate in the creation of a TOE.

The final product of the SAMAS and TAADS-R force development process is the MTOE, which is a modified version of the TOE. It prescribes a unit's organizational structure, personnel manning, and equipment requirements for the performance of a specific mission. For instance, a General Support Aviation Battalion (GSAB) MTOE would define a mission, and authorize the number and type of helicopters (i.e. UH-60, UH-1, OH-58, etc.) to be utilized in the fulfillment of the GSAB's mission.[7]

In summary, Army force structure is top-down driven, starting with directives established in the NMS and DPG. From their origins, each lower level provides more detailed requirements and defines them, thus culminating with an MTOE for implementation by "operating units." Tailoring of MTOE requirements to meet the assigned mission for the active Army, USAR, and ARNG identifies Army resource requirements. The MTOE for a LUH battalion for instance, defines the LUH mission, number of required personnel, and the type of helicopter needed to meet the LUH mission.

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[7] U.S. Army War College, "How the Army Runs: A Senior Leader Reference Handbook," Ch. 5, 1999-2000.

The remainder of this thesis is a case study of key decisions and political influences that affected the LUH program. This chapter described several macro-level processes that helped determine Army force structure, including the impact of changing roles and missions for the reserve component. Chapter II will provide a background to key events affecting the LUH program. Chapter III will present a detailed case study focusing on major decision points and the political influences on the LUH program. The final chapter will summarize the key political influences affecting the LUH program and assess their implications for future Guard aviation force structure planning and decision-making analysis.

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II. BACKGROUND

This chapter provides an overview of army aviation doctrine that underlies modernization priorities, key political events of the 1990s bearing on army aviation, and defense budget reduction initiatives affecting the LUH program and force structure. First, I discuss a short history of the roles and missions of utility helicopter and army doctrine. This includes a brief history of both the UH-1 and UH-60 helicopter and their operational use in the regular Army and the Army National Guard. Secondly, I will explain the impact of the Army Restructure Initiative (ARI) on Army aviation modernization strategy, and specifically, the impact of the RAH-66 Comanche program on utility helicopter modernization strategy. Thirdly, I will analyze the impact of reduced defense budgets and the Clinton administration's Bottom-Up Review on Army utility helicopter procurement initiatives.

A. ARMY DOCTRINE AND THE AGING HELICOPTER FLEET

The active Army primarily relies on the UH-60 Black Hawk helicopter to perform its doctrinally based utility helicopter mission. First produced in 1977, the Black Hawk is the Army's premier tactical transport helicopter performing roles such as combat assault, combat resupply, battlefield command and control, electronic warfare, and medical evacuation. Other U.S. Service branches and at least fifteen foreign countries utilize variants of the UH-60, performing roles pertinent to their respective service or nation. Doctrine set forth in Field Manual (FM) 100-5, Operations, mandates that Army forces must be capable of full-dimensional operations which is defined as:

> employing all means available to accomplish any given mission decisively and at the least cost—across the full range of possible operations in war and in operations other than war.[8]

[8] "Operations," Department of the Army, Field Manual 100-5, Ch. 1.

Furthermore, to function within the context of full-dimensional operations, army aviation assets, particularly utility helicopters, must successfully perform combat support and combat service support missions as established in FM 1-100, Army Aviation. This means aviation assets must be equipped with modernized systems capable of harnessing the technological revolution of the digitized battlefield.[9] The current mix of utility helicopter airframes within the Army's force structure calls this capability into question.

Before the introduction and fielding of the Black Hawk, the UH-1 Iroquois was the Army's primary helicopter for carrying out utility helicopter roles and missions. The UH-1 helicopter, commonly referred to as the "Huey," has served the Army well throughout the 1960s into the present, providing outstanding service in a utility helicopter role. Today, a significant number of Hueys continue to perform many of the utility helicopter roles and missions they traditionally supported in years past, however, these functions are now being overshadowed by the more technologically advanced and capable Black Hawk. In FY-01, the Army continues to operate the Huey, with more than 800 UH-1 helicopters[10] fielded within the Army National Guard force structure.

A significant portion of the Army's utility helicopter fleet consists of aging Vietnam era UH-1 helicopters. The UH-1, considered a non-modernized or "legacy" type helicopter, has surpassed its useful service life according to the Army. This helicopter has limited capabilities for carrying payloads at high altitudes and in hot temperatures, when compared to the capabilities of the newer UH-60 Black Hawk. Additionally, the UH-1 does not have modernized communications and avionics comparable to that of other modernized army helicopters. In

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[9] "Army Aviation," Department of the Army, Field Manual 1-100, Para 1-4.

[10] NGB-AVN, Aircraft Readiness Module, Nov 99.

other words, the current mix of aging UH-1 helicopters in both the regular Army and Army National Guard are not digitized and have limited performance capability. This will prevent them from effectively operating on the digitized battlefield of the future.[11]

B. AVIATION RESTRUCTURE INITIATIVE AND BUDGET

The Army's strategy to modernize its aviation force structure was set forth in the Aviation Restructure Initiative (ARI), which was prepared by the Army Aviation Warfighting Center in February 1993. ARI had several objectives, a few of which included the goal of reducing aviation operating costs, correcting deficiencies in the existing aviation force structure, and facilitating the retirement of older aircraft in the Army's inventory. The Army based its strategy for meeting these and other objectives on anticipated funding levels. ARI called for an aggressive plan to restructure and modernize the attack helicopter fleet by procuring the RAH-66 Comanche helicopter as well as enhancing the capabilities of the existing AH-64 Apache helicopter with the Apache Longbow upgrade. At that time, fiscal years 1995-1999 modernization plans called for spending $6.2 billion on aviation modernization programs including $4.7 billion earmarked for the Comanche and Longbow Apache programs. This meant all other aviation modernization initiatives, including the procurement of UH-60 Black Hawk helicopters and the LUH funding, would come from the remaining $2.5 billion.[12]

In addition to aviation modernization objectives, ARI proposed an altogether new aviation structure, the Light Utility Helicopter (LUH)

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[11] "An Analysis of U.S. Army Helicopter Programs," The Congress of the United States Congressional Budget Office, Dec 95. Available. [Online] :http://www.cbo.gov/showdoc.cfm?index=12&from=1&sequence=0 [2 Feb 00].

[12] "Army Aviation: Modernization Strategy Needs to Be Reassessed," United States General Accounting Office, Nov 94, GAO/NSIAD-95-9, p. 2.

battalion. The design of the LUH force structure is to supplement corps level utility helicopter missions and to provide capabilities where UH-60 helicopters are not required. The mission of the LUH is to provide utility aircraft for transporting personnel and equipment, such as critical leaders and staff, in support of corps operations. The LUH battalion has 4 flight companies with 8 UH-1 helicopters assigned to each company; for a total of 32 UH-1 helicopters in each battalion. Each company is a stand-alone unit capable of operating independently without battalion level support. The structure of each flight company allows the corps commander flexibility in task organizing the LUH by company slices.[13] Currently, each LUH battalion is assigned to the ARNG and arrayed over fourteen states.

The Light Utility Helicopter Study conducted by Training and Doctrine Command (TRADOC) in 1994, validated the necessity for LUH. In the absence of a commercial off the shelf (COTS) airframe to perform the LUH mission, the Army currently utilizes the UH-1H to carryout the LUH mission. Most of these helicopters, employing 1960's technology, have seen continuous service for at least 30 years. The Army's increased operational tempo, combined with the age of the UH-1 airframe itself, has driven up the operations and support costs associated with the UH-1. At the same time UH-1 reliability and maintainability have decreased.[14]

The Bottom-up Review (BUR) conducted by the Office of Secretary of Defense (OSD) in 1993 resulted in funding cuts for Black Hawk procurement beyond 1996. Consequently modernization funding for army aviation previously envisaged under the ARI was slashed. The purpose behind the BUR was to redefine Department of Defense strategy in the

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[13] Mike McMahon, "Aviation Restructuring Initiative," *U.S. Army Aviation Digest*, March/April 1994, p. 34.

[14] "Operational Requirements Document (ORD)," Light Utility Helicopter: Version 5, 28 Jan 99, Directorate of Combat Developments: U. S. Army Aviation Center.

post-Cold War period including realignment of force structure and modernization programs to that end. In turn, UH-60 procurement and fielding plans for the Army National Guard force structure were negatively affected by the decisions implemented through the BUR. Additionally, modernization funding for the LUH force structure would also be affected by defense budget cuts. Moreover, the BUR recommendations reduced the $6.7 billion in funding earmarked in the Army's Aviation Modernization Plan and ARI initiatives.

The BUR strategy emphasized fighting two simultaneous Major Regional Conflicts (MRC) in support of U.S. National Security Strategy. To support this two-MRC strategy the Army National Guard would transition a significant portion of its combat force of 37 brigades, including 15 enhanced readiness brigades.[15] These enhanced brigades consisted mainly of ground combat units not encompassing utility helicopter units or assets. Support for the Army's role in the two-MRC concept resulted in the enhanced brigades receiving priority funding for resource and modernization programs, with utility helicopter aviation programs receiving significantly less. Implementation of the BUR strategy, coupled with the nearly completed fielding of Black Hawks to the active Army, with only a partial fielding to the Guard, resulted in procurement for the UH-60 going unfunded beyond 1996. The remaining UH-1 fleet in an LUH role, as well as substituting for the UH-60, would have to suffice for accomplishing both state and federal missions, despite the shortage of Black Hawks in the Guard. The Army National Guard would continue to receive Black Hawks on a limited basis, as the active component force structure was downsized under the auspices of the BUR.

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[15] Aspin, Les. *Report on the Bottom-Up Review*. Washington, DC: Department of Defense, October 1993, pp. 93-94.

In light of the ARI and the BUR, the Army National Guard stood to lose utility helicopter assets and force structure. The regular Army gave the LUH mission and force structure to the Army National Guard as a concession for losses incurred through these restructuring and downsizing initiatives. Without maintaining utility helicopter force structure in the Guard, states would be ill-prepared for state active duty missions requiring utility helicopter support. State missions commonly include disaster relief support such as flood relief, fire fighting, search and rescue, and more recently have added homeland defense.

Initially under the ARI, all non-modernized UH-1 and OH-58A/C series helicopters were to be either eliminated or replaced by modernized aircraft. This plan, as well as other aviation modernization plans called for the retirement of the legacy fleet of tactically obsolete helicopters. In all, the elimination of more than 1,200 aircraft will reduce the Army's future inventory. The restructuring of army aviation force structure and elimination of older airframes fell within guidelines set by Total Army Analysis 2001 (TAA 01).[16]

Later, in light of drastic defense budget reductions and proposals recommended by the BUR, the army began to consider other options for modernizing the light utility fleet. The anticipated procurement costs associated with a COTS design as well as the Army's priority for the Comanche brought about this change in view. Since procurement of a COTS design to replace the UH-1 for the LUH role became more unlikely, industry teams introduced other proposals. Consideration was given to upgrading the existing UH-1 fleet, entailing a new engine design along with a modernized airframe and avionics package. This proposal primarily affected UH-1 helicopters assigned to the LUH battalions.

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[16] Jerry K. Hill, "Aviation Restructuring Initiative: The Divisional Aviation Brigade," *U. S. Army Aviation Digest*, Nov/Dec 1993, p. 46; Rick Scales, "Aviation Restructuring Initiative: The Way to the Future," *U.S. Army Aviation Digest*, Sep/Oct 1993, p. 17.

Despite the varied proposals for upgrading the UH-1, the aviation annex to Army Modernization Plan (AMP) released in March 1993 did not include a plan for an upgrade or a Service Life Extension Program (SLEP) for the existing UH-1 fleet.[17] Successive army aviation modernization plans throughout the 1990s would provide no definitive objectives for the LUH force structure or upgrade programs for the UH-1. The bulk of aviation modernization funds were prioritized for the Comanche program.

Through fiscal year 2001 all UH-1 helicopters in the LUH battalions, and within other Army aviation force structure, continue to operate with non-modernized utility helicopters. The battle over the defense budget and subsequent modernization funding continues to plague efforts at modernizing the utility helicopter force structure in the Army National Guard.

Since 1995 numerous aircraft safety of flight (SOF) messages have been issued on the UH-1 helicopter causing either complete grounding or restricted flight operations for most of the UH-1 fleet. Fatigue, relating to T-53 engine moving and drive train components, appears in the majority of SOF messages. A series of engine problems and non-availability of other UH-1 replacement parts have accelerated a required need for modernizing the remainder of the Army's utility helicopter fleet.[18] These SOF messages, related to age and fatigue of UH-1 engine and airframe components, have made an already difficult situation even worse.

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[17] Glen W. Goodman, "Army Aviation's Stellar Plans: Hamstrung by Budget Shortfalls," *Armed Forces Journal International*, April 1993, pp. 37-38.

[18] Chuck Steele, "Army Grounds Huey Fleet," *Defense Daily*, Vol. 198., No. 60, 31 Mar 98, [LEXIS-NEXIS]: 4 Feb 00; "Army UH-1 Fleet Grounded," Defense Daily, Vol. 202, No. 29, 11 May 99, [LEXIS-NEXIS]: 4 Feb 00.

C. CONCLUSION

This chapter provided an overview of significant events affecting aviation modernization initiatives. A review of background events impacting the LUH program and force structure is critical to the understanding of why certain modernization decisions were made, as well as providing insight into the challenges associated with procurement funding shortfalls. As explained earlier in this chapter, Army aviation programs such as the RAH-66 Comanche and Apache Longbow continue to hamper utility helicopter modernization efforts. Funding prioritization for these programs negatively impacts accelerated UH-60 procurement, UH-1 upgrade options, or the ability to procure a COTS design to fulfill the LUH missions. The ARI and the Army's modernization focus are stalling efforts to modernize the utility helicopter fleet in the Army National Guard. Consequently, the Army National Guard is ill-prepared to perform its state or wartime mission utilizing existing legacy UH-1 helicopters. This includes utility helicopter helicopters assets within the LUH battalions and the remaining Army National Guard force structure equipped with the UH-1.

III. THE LIGHT UTILITY HELICOPTER – CONSTRAINED BY THE DEFENSE BUDGET

A. INTRODUCTION – LUH ROLE AND DESIGN.

In this chapter I will discuss significant events and influences that affected the evolution of the LUH force structure, from its inception in the early 1990s, through present day. I provide a case study recounting the development of the LUH force structure, detailing LUH force structure decisions, and other interrelated helicopter modernization decisions.

I will first explain helicopter design requirements for the LUH force structure, the effect of the BUR and Comanche program on LUH funding, and the readjustment of reserve component aviation force structure carried out under the auspices of the Offsite Agreement. Second, after the LUH program stalled under the funding constraints for a COTS procurement, I describe proposed interim helicopter solutions considered by Army planners. Third, I illustrate where steps bypassed in the Army's force structure determination process complicated matters for a COTS procurement option. Finally a short discussion of related political agendas and influences is presented.

As mentioned earlier in chapter II, the LUH force structure is designed to support corps level missions where UH-60 helicopters are not required and more cost efficient battlefield transportation is desired for combat service support missions. Functionally, the LUH Battalion with each of its four companies serves in a combat support role at Corps level. One of the controversial issues surrounding LUH originates from the helicopter design necessary to perform the LUH role, along with the Army component best suited to receive the LUH force structure.

B. LUH DESIGN REQUIREMENTS

In response to memorandum directives initiated by Headquarters TRADOC in January 1994, the United States Army Aviation Center

(USAAVNC) Directorate of Combat Developments (DCD) performed two studies to identify a helicopter design sufficient to fulfill the LUH role. The second of the two studies was initiated to identify an appropriate Service Life Extension Program (SLEP) option in the event the UH-1 was selected to perform in the LUH role. The USAAVNC DCD forwarded the results of its two studies to TRADOC in May and June 1994.

This study included several recommendations with regard to both LUH force structure and the existing utility helicopter. First, that a commercial off the shelf (COTS) helicopter design be eliminated from consideration due to additional aircraft procurement costs as well as the limited number of LUH airframes that would be needed. Furthermore, it recommended that the UH-1 should be considered for the LUH mission only. Second, a UH-1 SLEP or upgraded operational requirements document (ORD)[19] be initiated to support the LUH mission. Third, any future analysis or studies of utility helicopter lift requirements include the LUH. The final recommendation included the elimination of the LUH battalion headquarters, with the subsequent reassignment of subordinate LUH flight companies to divisional general support aviation battalions (GSAB).

The SLEP study recommended minimum upgrade standards for the UH-1 if utilized as an interim design for the LUH mission. An upgraded UH-1 in lieu of a COTS design was based on the scenario of limited modernization funding. Serving in the LUH role, the UH-1 would receive avionics and wiring upgrades required for the modern digitized battlefield. In addition, and more significantly, a recommendation was made that Aviation and Troop Command (ATCOM) re-evaluate engine

[19] "Resource Allocation: The Formal Process, Vol. I,"p. 4-18: The document known as the ORD translates broad operational capabilities described in the MNS into specific performance requirements. It further defines the operational performance parameters needed to satisfy the need for each potential material solution, or in the case of the LUH, the required performance and design characteristics necessary to fulfill the LUH mission.

alternatives for the 131 UH-1s that would serve in the LUH force structure.

The LUH study, conducted by USAAVNC and TRADOC, failed to consider alternative aircraft capable of performing the LUH mission. Alternative COTS aircraft were eliminated from consideration due to cost, Department of the Army directed force structure reductions, and the long-range objectives of ARI. Furthermore, insufficient aviation modernization funds and a shortfall in UH-60 procurement forced the consideration of the UH-1 as an interim alternative for the LUH mission. Another shortcoming of the LUH study was the lack of information on LUH costs. The DCD staff excluded efforts at a comprehensive cost analysis during the study, primarily due to time constraints. The entire LUH study was completed in less than 30-days, thus implying a less than comprehensive analysis for all potential design alternatives for the LUH. Moreover, the procurement of a COTS helicopter to serve in the LUH role ran contrary to ARI goals and objectives for a future aviation force structure: a force structure containing reduced logistic requirements and a decrease in overall modernization costs.[20] The Army felt it could ill-afford to add another helicopter to the inventory, which required a new separate logistics and maintenance trail for its support. By limiting the scope of available options for a LUH design, the Army forced itself to ultimately accept the UH-1 as the most likely candidate to fulfill the LUH mission.

[20] Light Utility Helicopter (LUH) & UH-1 Service Life Extension Program (SLEP) Study, Department of the Army, HQ TRADOC and USAAVNC, May 1994.

C. RECONNAISSANCE AND SECURITY–IMPACT OF COMMANCHE AND ARI

ARI, and all Army Aviation modernization plans since 1993, identified reconnaissance and security missions as a focal point for aviation modernization. As a CONUS-based power projection Army, reconnaissance and security missions are essential to the success of forward deployed forces. Operationally, air maneuver by aviation assets in a reconnaissance and security role protects friendly ground forces and supports the maneuver battle, enabling the ground commander to exploit tactical opportunities.[21] This is why the Comanche helicopter is seen as the primary focus of the Army's long-term aviation modernization strategy. It is also the Army's most expensive acquisition program at an overall projected cost of $48 billion. By 2008 Comanche is projected to account for 64 percent of the Army Aviation budget, when the estimated annual production costs will reach at least $2 billion. This translates into reduced funding levels for other aviation modernization requirements, such as those associated with the utility helicopter fleet.[22]

The decision to prioritize aircraft modernization resources for the Comanche and Apache Longbow upgrade programs forced the retention of older utility and cargo airframes in the Army's inventory. Additionally, prioritized resourcing for these programs severely impacted both the UH-60 and LUH programs. The importance of Comanche was cited in the 1993 BUR, noting, "Our experience in the Persian Gulf war and other recent operations has shown that the battlefield information that reconnaissance helicopters provide is becoming increasingly important in modern

[21] Aviation Restructure Initiative Briefing, U.S. Army Aviation Center, September 1993; 1998 Army Modernization Plan, Department of the Army, 13 Apr 98, Annex G: Aviation.

[22] "Comanche Program Costs, Schedule, and Performance Status: Defense Acquisitions," United States General Accounting Office, Aug 99: GAO/NSIAD-99-146.

warfare."[23] As a consequence of these aviation priorities, increased UH-60 procurement, decisions relating to a COTS LUH design, and other utility helicopter modernization initiatives would languish.

D. OFFSITE AGREEMENT, ARI, AND ARMY BUDGET

One objective of ARI, the reduction of older airframes from the Army's inventory, led all components into a three-way competition for utility helicopter assets. A complicating factor intensifying the competition was a reduced Army aviation modernization budget. The Army elected to prioritize funding for programs like the Comanche and Apache Longbow. Modernization objectives for both these programs were formalized in the 1993 Army Modernization Plan and continued with each subsequent plan through 1998.[24]

The regular Army, USAR, and the ARNG all competed for utility helicopter assets, however the 1993 Active/Reserve Offsite Agreement on roles and readiness changed all that. Announced by Secretary of Defense Les Aspin in December 1993, the Offsite Agreement[25] forged a new partnership among the Army's three components. The agreement was in response to the end of the Cold War and reflected commitment to a power projection reshaping initiative by active and reserve components. In the end, the agreement among all of the components eliminated the USAR as a major competitor for rotary-wing aviation force structure, including utility helicopter assets. Under the agreement the USAR utility helicopter force structure was transferred to the ARNG. In turn, the USAR received combat service support force structure from the ARNG. Despite this

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[23] Glen W. Goodman, Jr., "Second to None: US Army Aviation's Future Looks Brighter Than Ever," *Armed Forces Journal*, Mar 96, pp. 23, 26.

[24] Aviation Restructure Initiative Briefing, U.S. Army Aviation Center, September 1993; 1993 Army Modernization Plans; 1996 Army Modernization Plan; 1998 Army Modernization Plan.

[25] J. H. Binford Peay, III, John R. D'Araujo, Jr., and Max Baratz, "Building for the Future: The Active/Reserve Offsite Agreement," *Army*, 44 (November 1994): 44-49.

transfer of aviation force structure, ARNG gains in utility helicopter assets did not offset total helicopter losses incurred under the ARI.

Even after the Offsite Agreement, the ARI and defense budget reductions still posed a threat to the existing aviation force structure within the active Army and ARNG. The ARNG was still programmed to lose a significant number of utility helicopters and parts of its aviation force structure. Under ARI, both the Army and ARNG were scheduled to reduce the utility helicopter fleet by 33 percent, which included more than 1300 UH-1 airframes.[26] The loss of this number of helicopters would have a negative impact on state requirements to support disaster relief and other similar operations. The ARNG viewed the LUH structure as a means to maintain utility helicopter force structure in the Guard.[27] The end to any additional UH-60 procurement beyond fiscal year 1996 helped support the ARNG position on maintaining existing utility helicopter assets. The defense budget did not authorize funding for additional UH-60 procurement beyond 1996. Until a COTS design could be fielded, the UH-1 would suffice as a suitable substitute for the LUH force structure.

Guidance handed down in the 1993 BUR by the OSD reaffirmed some of the Army's aviation modernization priorities, including those associated with attack and reconnaissance helicopter assets. However it neglected to provide any mention of utility helicopter modernization or to address a comprehensive acquisition strategy.[28] Furthermore, the Army then prioritized aviation funding for both the Comanche and Apache Longbow programs. As long as funding was allocated toward these

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[26] "An Analysis of the U.S. Army Helicopter Programs." Congressional Budget Office, Dec 95, Available [Online]:http://www.cbo.gov/showdoc.cfm?index=12&from=1&sequence=4, [2 Feb 00].

[27] Albert Patterson, interview by author, Enterprise, Al., 12 September 2000; Gregory Parrish, interview by author, Harrisburg, Pa.,16 February 2000.

[28] Aspin, Les. *Report on the Bottom-Up Review*. Washington, DC: Department of Defense, October 1993.

programs, no accelerated procurement of the UH-60 and a COTS LUH design would likely materialize.

E. REQUIREMENT FOR A LUH MISSION

The Army identified a battlefield requirement for a LUH force structure. Although the Army had set its sights on Comanche and Longbow programs as their priority, it also identified a requirement for the LUH to supplement battlefield combat service support needs. Surveyed Aviation Brigade commanders throughout the Army and ARNG identified a need for a LUH force structure soon after it became apparent that ARI would reduce their utility mission capabilities. Utility helicopter missions routinely given to battalion general support aviation or air assault battalions now degraded combat power in the ARI design force structures. For example, in an assault helicopter company, instead of having twenty-three UH-1 helicopters at their disposal, commanders now had only eight to accomplish the same number of missions. In other words commanders had fewer utility helicopter assets to support their primary mission of combat air movement and air assault in addition to performing combat service support or administrative type transport missions. The requirement for aviation assets to support these non-combat service missions has always existed. The advent of ARI and an austere aviation modernization budget forced the Army to prioritize funding for other initiatives, rather than the LUH program.

F. FORCE STRUCTURE ASSIGNMENT

Another point of contention was where to assign the LUH force structure. One option, as discussed in a January 1996 NGB Aviation information paper, favored assignment of one LUH Company to each of the eighteen divisional GSABs. This assignment relationship was favored mainly in response to feedback received at a previous Aviation Brigade Commanders Conference. Aviation commanders were concerned with having access to efficient, cost-effective aerial transport of personnel and

equipment, utilizing aircraft that required something less than the more costly UH-60; meaning primarily operations and maintenance costs. ARI had reduced their available helicopter assets, forcing them to divert their available UH-60 platforms to service support missions. Under the proposal eighteen additional LUH companies would be formed for each of the active and reserve combat divisions. These companies would be formed in addition to those LUH battalions organic to XVIII Corps, III Corps and I Corps. The LUH companies under each divisional GSAB would provide the needed support for staff transport, liaison, air messenger service, and air movement of supply missions.[29]

The problem with this plan for the ARNG was that LUH force structure gains proposed by this plan would not make up for total losses incurred under ARI. The active Army would receive a significant portion of force structure, leaving the ARNG with an inadequate number of utility helicopters to perform state support missions. The ARNG would need to acquire all LUH companies to even come close to regaining ARI losses.

As a result of the Offsite Agreement, the USAR was removed from consideration as a recipient of the LUH force structure. Competition over which Army component would gain this structure lay between the regular Army and the ARNG. The procurement of a COTS design aircraft to serve in the LUH role would certainly favor the active army over the guard. However such an acquisition was in conflict with aviation modernization objectives as envisaged under ARI, and the Army's Modernization Plans that emphasized development of attack and reconnaissance capabilities. Approval of a COTS design by Deputy Chief of Staff for Operations and Plans (DCSOPS) would also allow LUH to compete against Comanche,

[29] "Force Structure Development," Paul Kelly & Joseph Ferreira, National Guard Bureau Aviation (NGB-AVN-OR), Information Paper, 22 Jan 96.

Apache Longbow, and other aviation budget programs. Given the austere budget, priority placed on Comanche and Longbow, and congressional scrutiny of Comanche developmental delays, the Army could not also afford a COTS procurement. Since its inception in 1983, the Comanche program has been restructured five times, primarily out of concern for program affordability and changing requirements. The last restructuring took place in July 1998.[30] Given the time and resources already invested, the Army was not about to jeopardize the Comanche program by redirecting procurement funds for LUH.

G. CONGRESSIONAL CRITICISM

According to an August 1999 GAO Report, the Army would not achieve its utility helicopter requirements due to funding imbalances in the 1998 aviation modernization plan. The Army recognized this problem and made the decision to keep the UH-1 in service well into the 21st century. They also identified an unfunded requirement for ninety UH-60 helicopters. The Senate Armed Services Committee was critical of this plan, and in a report accompanying the 1998 National Defense Authorization Bill cited readiness concerns with regard to the National Guard utility helicopter fleet. An earlier GAO report in November 1994 cited similar concerns and the consequences of the Army's strategy to develop the Comanche at the expense of other modernization programs.[31]

The planned cessation of UH-60 procurement beyond 1996, and pressure from Congress and the ARNG, forced the Army to consider alternatives to their overall utility helicopter modernization strategy. The Army's aviation modernization plan was too broad, given the reduced

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[30] "Comanche Program Costs, Schedule, and Performance Status: Defense Acquisitions," United States General Accounting Office Aug 99: GAO/NSIAD-99-146.

[31] "Comanche Program Costs, Schedule, and Performance Status: Defense Acquisitions," United States General Accounting Office, Aug 99: GAO/NSIAD-99-146; "Modernization Strategy Needs to be Reassessed: Army Aviation," United States General Accounting Office, Nov 94: GAO/NSIAD-95-9.

funds budgeted for modernization. Senate Armed Services Committee members and professional staff criticized the plan for attempting to keep alive too many programs. The high cost of Comanche made it difficult to justify so many different programs for Army aviation. Although the Army acknowledged that most of its utility helicopter fleet had been modernized with the UH-60, this did not include all of the utility helicopters assigned to the ARNG. Approximately 30 percent of the ARNG utility helicopter fleet would remain "unmodernized" after the last UH-60 helicopters rolled off the Sikorsky assembly lines. The pressures and criticism exerted upon the Army forced the consideration of less expensive options to sustain or upgrade the existing legacy utility fleet in the ARNG.[32]

H. T800 ENGINE OPTION: WORKING WITH CONTRACTOR INTERESTS

By late 1996 the Army considered less expensive options to a COTS helicopter design as a result of the ongoing modernization budget shortfall. One option given serious consideration was a plan to re-engine the UH-1H with the Comanche T800 engine. Both the Army and NGB leadership signed a Memorandum of Agreement (MOA) in a cooperative effort to facilitate the T800 engine replacement option. Essentially the re-engine option was to be part of an Early Production And Fielding (EPAF) plan for the Comanche T800 engine. An EPAF of the T800 would allow the engines to be field-tested in the UH-1H airframe, as well as provide for an interim replacement for the current T53 engine. Later, upon retirement, the T800 engines would be recovered from the UH-1 fleet and rebuilt for use in the Comanche helicopter. The concept or idea behind replacing T53 engines with the T800 originated from a 1994-95 success

[32] Greg Caires and Gary Crouse, "OSD Says Army's Black Hawk Plan Threatens Sikorsky's Survival," *Defense Weekly*, 12 July 1996, Vol 192, No 8.[Lexis-Nexis]: 4 Feb 00.

story involving the replacement of UH-1 engines in U.S. Border Patrol helicopters.

An advantage to fielding the T800 engine ahead of the Comanche's schedule was in its contribution to cost savings. The manufacturer, Allied Signal (LHTEC), was prepared to begin full-scale manufacturing of the engine, however, delays in Comanche airframe and system tests would soon incur additional engine production costs. Airframe fielding and associated system testing was at least three years behind T800 engine development. The Utility Helicopter program manager (PM) saw the UH-1 T800 option as an opportunity to reduce overall costs for the Comanche program; by maintaining minimum production levels for the T800 engine with LHTEC, while at the same time providing a viable interim solution to the Army's utility helicopter predicament.[33]

Additional advantages to the T800 replacement option included first, extensive field-testing of the T800 engines before full-scale Comanche production began, thus providing valuable risk reduction data for long-term cost savings. Second, savings in Comanche non-recurring manufacturing costs by utilizing NGB funds to purchase approximately one hundred fifty T800 engines under an EPAF plan. Cost savings in this arena were estimated to be in excess of $50 million. Third, the T800 replacement of the UH-1 T53 engine allowed for an interim solution to the UH-1 engine problem in the ARNG as well as a work-around to the non-approved LUH ORD. Until the UH-1 was retired, an engine upgrade appeared a wise interim solution for the ARNG. Fourth, the enhancement of a joint working relationship between the active and reserve components over priority modernization endeavors made for good politics. A cooperative modernization effort between NGB and the active Army on the T800 EPAF plan appeared to be a win for both sides. Despite all the

[33] Michael Chase, Interview by author, Arlington, VA, 23 April 2001.

positives, the Army decided against the engine upgrade plan, due to its incompatibility with the aviation modernization objectives, the planned retirement of legacy UH-1 airframes, and funding priorities for Comanche.

By June 1997 the T800 replacement option began to give way to a commercial helicopter lease plan for the LUH. A lease plan was considered due to concern for long-term costs associated with the T800 engine replacement option. Another factor was cost savings as compared to the unfunded COTS procurement option. The lease plan could be funded through the aviation operations and maintenance (O&M) budget, which was budgeted on an annual basis. Therefore it would not compete for procurement dollars earmarked for Comanche and other aviation acquisition programs. The lease option never materialized, as the Army did not approve of the plan. The Army was unwilling to spend O&M funds to support such a program.

Although the ARNG favored the leasing option, the Army considered it too costly and a budget drain on O&M dollars.[34] In addition to the helicopter lease plan, a T-53 engine-leasing plan was also brought to the table. The engine lease plan, involving rebuilt T-53 engines was also disapproved for the same reasons as the aircraft lease option; overall O&M budget costs. The Army remained focused on Comanche and other programs through 1999, with little change occurring for LUH or utility helicopter modernization.

A comprehensive utility helicopter fleet modernization study, sponsored by the utility helicopter program manager, was completed in

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[34] Greg Caires, "T800 Turbine Unlikely to be Unseated as UH-1H Replacement Engine," *Defense Daily*, 15 April 1997: Vol. 195, No. 11,[Lexis-Nexis]: 4 Feb 00; Robert P. Birmingham, "T800 Early Production," *Army Aviation*, 28 February 1997: Vol. 46, No. 2, 9-10.

May 1999. The purpose of the study was to determine the most operationally effective and affordable program to modernize the utility helicopter fleet for the FY00-FY25 time period. Operational Requirement Documents (ORD) for the future UH-60X and LUH were both considered in the study. The fifteen-month study was assisted by a General Officer Steering Committee (GOSC) which included representatives from the USAAVNC, NGB, and Program Manager (PM) Comanche, as well as more than ten other army commands or staff directorates. The May 1999 fleet modernization study was both thorough and systematic in its analysis.

Army National Guard state mission requirements were given consideration in the utility helicopter fleet modernization analysis. Prior to approval of the recommendations made in the study, no approved plan existed which addressed the aging UH-1 and UH-60 fleet. The lack of an approved modernization strategy has contributed to inadequate funding to support a Force XXI and Army after next (AAN) fleet modernization. Several versions of the UH-1 were considered for the LUH role and for continuation in the ARNG strategic reserve divisions. This included a UH-1 with an engine upgrade and "digitized or bussed" configuration, as well as a "non-bussed" configuration. Eight utility helicopter fleet mix options were developed in the fleet modernization analysis. All options included the LUH in various UH-1 upgrade and non-upgrade configurations. Option three was selected as the overall recommended utility fleet modernization strategy. This option included an LUH ORD-compliant "digitized" aircraft capable of meeting the emerging LUH requirements. In other words a LUH design comparable to the UH-1 with an engine upgrade and "bussed" for the digitized battlefield.[35]

[35] "Utility Helicopter Fleet Modernization Study," U.S. Army Aviation and Missile Command, May 1999.

However, since 1994, more than eighteen safety of flight (SOF) messages related to airframe or component fatigue already had plagued the UH-1. Furthermore, the timing of the study's release coincided with two more significant SOF messages and subsequent UH-1 helicopter groundings. The recommendations of the fleet modernization study as related to a LUH design were for the most part ignored; overshadowed by the continued plight of the aging UH-1 and the advent of a new aviation modernization strategy.[36] The new strategy included the creation of a new force structure called the Multi-function Battalion (MFB), which eliminated the requirement for the LUH force structure.

On April 4, 2000, at a DOD news briefing, BG Craig D. Hackett, the Director of Requirements, Assistant Deputy Chief of Staff for Operations and Plans (ADCSOP), Force Development and other participating staff announced a new Army aviation modernization program. They presented the MFB force structure plan and fielded varied press questions relating to the new aviation modernization plan. During the news briefing one of BG Hackett's staff announced the elimination of the LUH battalion from the Army's future force structure.[37]

I. DOCTRINE, TRAINING, LEADER DEVELOPMENT, ORGANIZATION, MATERIAL, AND SOLDIER REQUIREMENTS (DTLOMS) IMPACT

Continued support and justification for a LUH budget depended upon the Army's force structure determination process, primarily the development of doctrine, training, leader development, organization, material, and soldier requirements. Better known as DTLOMS, this force

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[36] "AMCOM Aviation Safety Messages," U.S. Army Aviation and Missile Command, Available [Online]:http://www.redstone.army.mil/sof/safetytable.htm, [30 Jan 00].

[37] "Special Briefing on Army Aviation Modernization Program," Hackett, Craig D. DOD News Briefing. Available [Online]:http://www.defenselink.mil/news/ Apr2000/t04042000_t404army.html, [4 April 2000].

structure determination process normally occurs in a specific order beginning with doctrine development, and ending in material design. DTLOMS is a sub-process of Total Army Analysis.[38]

Another barrier for the continued development of the LUH force structure and COTS design was due to an incomplete DTLOMS process. Two domains of DTLOMS, doctrine and material, were never fully developed which resulted in the exclusion of LUH from the Army's aircraft procurement, also known as the APA budget. As long as the DTLOMS process remained incomplete, TRADOC could neither complete its required staffing, nor could DSCOPS approve LUH for inclusion to the APA budget.[39]

Doctrine for the LUH force structure was neither approved by TRADOC nor completed by doctrine developers in the form of doctrinal field manuals. Although a need existed for LUH, doctrinal guidance on LUH battalion tactical employment was never completed by USAAVNC in coordination with TRADOC. The second domain of material was of more immediate significance. In the case of LUH, material development was tied directly to the selection of the aircraft design required to fulfill the LUH role. Selection of a particular helicopter design - whether a COTS design, an upgraded UH-1, or something else - necessitated the approval of an ORD.

J. POLITICAL AGENDAS

During my analysis for political influences on the LUH force structure determination process, I investigated possible DOD advisory committee influence on the decision-making process by the Army. The

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[38] "Force Development: Requirements Determination," Department of the Army: Training and Doctrine Command, TRADOC Pamphlet 71-9, 5 Nov 99, p 13; Albert Patterson, Interview by author, Enterprise, Pa., 12 September 2000.

[39] Albert Patterson, Interview by author, Enterprise, Al.,12 September 2000.

member composition of advisory committees often leads to bias in the shaping of specific policies. DOD advisory committees, whose members are influenced by their external industrial and financial ties, are no exception. Advisory committee membership usually consists of people with a clear interest in government decision-making and the impact on DOD contractors, financial institutions, and industry. All too often their arguments and committee representation reflect more the private than the public interest. Evidence shows the strong presence of DOD contractor representation on advisory committees. Historically, companies such as Boeing, Lockheed, United Technologies, and others, are represented on these committees. For example, DOD advisory committee membership at the end of 1979 stood at 777 members.[40]

Select interviews with retired Army personnel and congressional staff revealed no evidence of advisory committee influence on the LUH program. However several of the LUH design options, mainly the various UH-1 engine upgrade and leasing plans, appeared to at least attract some interest by select members of Congress. This interest was probably due in part to the effect such plans had within their respective congressional districts. LUH was influenced more by decisions made within DOD and the Army, rather than by any committee, or even individual membership to each respective Armed Services committee on Capital Hill.[41]

The airframe design requirement for the LUH as explained in this chapter is fairly straightforward. The Army had basically two design choices for the LUH; a COTS procurement or several SLEP or upgrade options for the UH-1. I also discussed how BUR budget constraints and

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[40] Gordon, Adams, "The Iron Triangle," (Transaction Books), New Brunswick, NJ, 1982, 167.

[41] John Barnes, Senate Armed Services Committee, Interview by Author, Washington, DC, 4 January 2001; Albert Patterson, Interview by author, Enterprise, Al., 12 September 2000.

pressures to accelerate an already behind schedule Comanche program, forced the Army to prioritize procurement funding for the Comanche instead of the LUH. In addition, a limited aviation modernization budget and the growing age of the UH-1 fleet caused the Army to focus efforts on more long-range priorities. Continued reliance on the UH-1, now in service for more than thirty years, was not part of the Army's future force structure plan under the ARI. Complicating matters, the incompletely followed Army force structure determination process, known as DTLOMS, provided the Army a means for delaying final decision on a COTS design. This decision-making tactic, or lack of a decision, prevented the siphoning-off of aviation procurement funds from the Comanche program.

Regarding political influences on the LUH program, I discovered that most influences and force structure decisions were made within the Army itself. Although some members of Congress voiced concerns about the pace of Army aviation modernization, these concerns had little or no influence on LUH decisions made by the Army. If anything Congressional pressures or concerns weighed more heavily on the Comanche program.

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IV. CONCLUSIONS: SUMMARY OF FACTORS AFFECTING THE LUH FORCE STRUCTURE

In this chapter, I will summarize the key factors that affected decision-making about the LUH force structure. A constrained Army modernization budget, the ways in which the Army force structure was determined, and incompatible Army and ARNG goals contributed to LUH design and deployment plans that proved to be inadequate to the aircraft's missions.

The LUH force structure evolved out of a need for cost-effective battlefield air transportation that would not detract from the combat power of forward-operating aviation units. In other words, utility helicopters would operate in the field so that UH-60s would not be drawn away from combat missions to provide non-combat and administrative transport. Many factors influenced the direction the LUH would take in its evolution from the early LHX program[42] to its eventual form under the aviation-restructuring plan. The remainder of this chapter will summarize key factors and political influences that affected the LUH program. The summary will include general recommendations for future aviation force structure decision-making.

A. BUDGETARY CONSTRAINTS

The 1993 BUR, combined with defense budget reductions, derailed the Army's plan for ARI. The anticipated funding needed to implement ARI along the Army's planned time line never materialized. Since the Comanche program was still deemed the cornerstone of Army aviation's

[42] The Light Helicopter Experimental (LHX) program of the 1980s eventually evolved into the RAH-66 Comanche program. LHX originally encompassed light utility, attack, and scout helicopter airframe configurations using one basic helicopter design. The light utility variant was eliminated in 1988 due to budget costs. (Douglas W. Nelms, "LHX and the Army Modernization Plan," *National Defense*, Sep 89, p. 38.)

future, it was inevitable that LUH funding would be either reduced or eliminated. Little thought was given to the impact ARI would have on utility helicopter assets in both the Army and the ARNG.

Studies conducted in 1994 by the USAAVNC Directorate of Combat Development (DCD) eliminated a COTS design option for the LUH airframe because of its cost. DCD planners, however, were not given adequate time to thoroughly examine all potential modernization designs. Abandoning the COTS airframe allowed DCD personnel to complete their hurried analyses within the mandated 30-day period. Alternative solutions to LUH modernization opened the door for more defense interests to get involved in the decision-making. Defense contractors competing to upgrade the UH-1 with digitized systems helped to prolong the entire modernization effort.

Over several years no clear consensus was reached on a LUH design option. Officials decided that the ARNG would receive all four existing UH-1 helicopter battalions as a temporary measure, until an acceptable replacement design could be budgeted through the DTLOMS process. This long period of indecisiveness and inaction allowed other factors to come into play, and eroded UH-1 upgrade feasibility. The vague guidance for a future LUH force structure offered in Army modernization plans throughout the 1990s did nothing to assist the decision makers.

In retrospect, ARI goals and objectives needed rethinking once it became apparent that modernization funds would be inadequate. The Army was fixated on moving forward with the Comanche program, and was unwilling to modify its plans based on fiscal realities. It was inevitable that other aviation modernization efforts would suffer at the expense of Comanche. Even when it was clear there would be no more money for other programs, however, the Army continued to avoid realistic planning for the worst possible budgetary scenario. The two appropriate options were either to fund the LUH force according to original

modernization planning, or to eliminate it altogether. Austere budgets and shifting conditions make timely decisions and program flexibility indispensable for long-range planning.

B. FORCE DEVELOPMENT PROCESS: DTLOMS

The DTLOMS process demands a clear roadmap for force structure determination and development. Political and budgetary considerations should not circumvent a thorough analysis of doctrine, training, leader development, organization, material, and soldier requirements. In the event, analysts bypassed several steps in the DTLOMS process, resulting in the interim LUH decision, on the assumption that problems could be resolved later. Both the doctrine and material solutions portions of the analysis circumvented normal DTLOMS staffing procedures. This failure to follow doctrine meant that the final decision on the LUH was made without full information about the LUH force structure and its capabilities on the battlefield. Even after the first LUH battalions were fielded in the ARNG, division and corps commanders and their staffs were unaware of their existence because doctrinal publications made no mention of them.[43]

A material solution--the approval of the LUH ORD by DCSOPS--also remained problematic. DCSOPS approval would have made the LUH program eligible to compete against Comanche for existing aviation procurement funds. As long as the ORD remained incomplete or its approval was delayed, funding for a COTS aircraft design or an upgraded UH-1 with a T800 engine would not be forthcoming. The DTLOMS and ORD process, delayed due to internal staffing and decision-making problems, lasted for approximately five years.[44] TRADOC pressured the Army to eliminate the LUH due to the cost of modernizing the aging UH-1

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[43] Albert Patterson, Interview by author, Enterprise, Pa., 12 September 2000.

[44] Information on the exact date of ORD initiation was not available. The estimate was based on a DCD memorandum directing a review of the mission needs statement (MNS) for the LUH. The MNS is normally completed just prior to the initiation of the ORD process.

fleet.[45] Even as the 2000 Army Modernization Plan that eliminated LUH from the future Army was published, the ORD still had not been approved.

C. INCOMPATIBLE GOALS OF THE ARMY AND ARMY NATIONAL GUARD

The Army and ARNG have incompatible goals for utility helicopter modernization. Successive Army aviation modernization plans have demonstrated that Comanche takes priority over the LUH. The goal of the ARNG, by contrast, is to maintain its aviation force primarily to support state disaster relief. If the ARNG is mobilized, however, it also must be prepared for corps and division level wartime operations. The fact that it still depends on legacy aircraft such as the UH-1, AH-1, and OH-58 airframes puts the Guard at least a full generation behind the active component. The plan to upgrade UH-1 with a T800 engine was not considered a feasible option. Theater commanders-in-chief (CINCs) were not interested in employing outdated aircraft, nor did an upgraded UH-1 make an adequate substitute for new aircraft designed for the LUH mission.[46] At present, Comanche also does not meet the state and wartime mission requirements of the ARNG.

ARI set the stage for development of incompatible Army-ARNG goals and objectives. Planners did not fully assess the impact of ARI on the reserve component, nor did they correctly anticipate the effect budget reductions would have on modernization. The ARNG agreed to sign on with ARI only after it was decided that the LUH force structure would be given to the Guard.[47]

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[45] Corbitt Gamble, Telephone interview by author, Fort Rucker, Al., 28 January 2000.

[46] John Barnes, Senate Armed Services Committee, Interview by author, Washington, DC., 4 January 2000.

[47] Corbitt Gamble, Telephone interview by author, Fort Rucker, Al., 28 January 2000.

ARNG utility helicopter assets at the battalion level traditionally are distributed over state boundaries. This allows the state adjutant generals and supporting staff directorates to influence or shape aviation policies within their state. With the introduction of the ARI, states began to compete against one another for utility helicopter resources. Despite the importance of continued modernization, maintaining the existing utility helicopter force structure took precedence over other needs.

The regular Army did not experience the same draw down as the ARNG. The cutbacks forced by ARI stymied any effort to formulate a sound helicopter modernization strategy for both Army components. Future planning for modernization must take into account the needs of each component. Incompatible goals and objectives will only serve to delay decision making, as we have seen in the current implementation of an inadequate LUH program.

D. POLITICAL INFLUENCES ON LUH

The Senate Armed Services Committee (SASC) had little direct impact on LUH-related decisions. Senators and their professional staff did, however, let the Army know what sort of a modernization plan would be acceptable. For several years prior to the introduction of the MFB force structure, Congress had been asking for a sound modernization plan from the Army. The senators' main criticism of Army plans was that they contained too many costly programs (e.g., Comanche) for the available budget. If the Army had presented a sound plan for the LUH structure and airframe design, with a detailed justification of its battlefield need, the SASC likely would have supported it.

Although DOD advisory committee members historically have close ties to industry and finance, research for this paper uncovered no link between advisory committees and the LUH force structure decision-making process.

E. CONSIDERATIONS

As previously mentioned, periods characterized by austere defense budgets require a certain degree of planning flexibility when developing future aviation modernization plans. Plan flexibility and the ability to integrate change must be ingredients to any modernization plan formulated in the post-Cold War period. Aviation planners and decision-makers must be willing and able to modify plans based on fiscal realities, emerging threats, and as a result of new factors impacting modernization initiatives. This could include an accelerated procurement and fielding of a particular type of airframe based on need, or as a consequence of unanticipated problems with the older fleet of aircraft. The unfunded LUH and the aging UH-1 fleet is a case in point. However immediate the need, a situation involving accelerated procurement should be compatible with the long-range objectives of any modernization plan. Plan flexibility also should allow for the modification of long-range objectives if warranted.

DTLOMS as part of the Army procurement process tends to function effectively when properly implemented in acquisition of new combat systems. The Army's helicopter procurement process is no exception. When particular steps are bypassed in the DTLOMS process, combat system procurement can become problematic. Continual delays in decision-making or staffing actions can have a negative influence on system procurement. This includes increased susceptibility to unforeseen events, influences, or circumstances.

The Army and ARNG have incompatible goals for utility helicopter modernization. Any future plan must take into account the requirements of the Regular Army, Army National Guard, and Army Reserve. The fielding of modernized helicopter airframes to both the Guard and Regular Army simultaneously will establish a common ground where cooperative efforts can be cultivated among the three components. Common goals,

objectives, and priorities can then be established. This would include, but are not limited to, resource sharing and joint training opportunities.

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